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Claims 1-15 are currently in the application. Claims 1- 15 stand rejected under 35 U.S.C 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the art that the inventor, at the time the application was filed, had possession of the claimed invention.

Enclosed herewith is a copy of ASTM D 720, "Standard Test Method for Free-Swelling Index of Coal", published May, 1992, denoted Exhibit 1. As stated at page 6, lines 1-11 of the specification, "Coals having free swell indices below these preferred ranges may not agglomerate properly leaving a powder mass or sinter, but not swell or foam, while coals exhibiting free swell indices above these preferred ranges may heave upon foaming and collapse upon themselves leaving a dense compact." All of the coals used to produce suitable cellular coal-based materials in accordance with the Examples fell within the prescribed range.

Accordingly, in view of the submission of the enclosed Exhibit 1 and the disclosure contained in the specification, it is respectfully submitted that all requirements of U.S.C. 112, first paragraph, have been met and rejection on the basis thereof should be withdrawn.

Claims 1-5 stand rejected under 35 U.S.C. 103(a) as unpatentable over Harnett, U.S. Patent No. 3,309,437 combined with GB 1,489,690 to Madley et al. It is the Examiner's position that Harnett teaches a porous based product having an

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apparent density of 0.93 g/cc. The material produced by Harnett is not a foam or regular cellular material. The true density of typical coals is about 1.4 g/cc and calcined coals 1.6 to 1.8 g/cc. Foams by definition comprise more than about 70% porosity, i. e. 30% solids, so the foam bulk density of a "cellular coal or foam" produced from a 1.8 g/cc solid carbon, i.e. a true foam having 70 % porosity and comprising 30 % solids, would be significantly less than 0.93 g/cc and, in fact, somewhat less than on the order of 0.8 g/cc as claimed in the instant application. Thus, to rely upon Harnett as anticipatory of the cellular materials of the present invention, in any fashion, is clearly erroneous since the materials of Harnett are not even foams or cellular in the sense clearly intended by the present invention.

The Examiner posits that "it would be obvious that the coals of Harnett would inherently have a swell index of about 3.5 and about 5.0 in view of Madley et al which it is alleged teach that the swelling properties of coals can be controlled by varying pretreatment conditions such as temperature and reaction time. The swell index of a particular coal as determined by aforementioned ASTM D 720 is an inherent property of the coal, as mined. Madley et al on the other hand are apparently trying to reduce the swelling propensity of high volatile coals for purposes of permitting their appropriate blending with as second coal to permit briquetting thereof. There is absolutely no suggestion that such coals could be used to produce cellular coal based products having the properties described in the instant application or for that matter that such "modified" coal materials would or could be applied in the totally non-analogous process of Harnett. It is only with the

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teachings of the present invention before them that anyone would even reach for this combination of references to suggest that the process and materials of the present invention are "obvious". It is therefore respectfully submitted that rejection of claims 1-5 on the aforementioned basis is improper and should be withdrawn.

Claims 5-10 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Harnett combined with Madley et al and further in view of U.S. Patent No. 4,127,391 to Koppelman. For the reasons expressed hereinabove, it is respectfully submitted that any combination of Harnett and Madley et al is without basis and the same arguments apply equally in the case of this rejection. Additionally, although the Examiner suggests that it would be obvious to the skilled artisan to produce the coal-based cellular materials of the present invention given the teachings of Harnett, Madley et al and Koppelman, it is respectfully submitted that there is even less basis for combining the first two references with Koppelman given the absence of any suggestion to do so in any of the three references cited. Again, it is only with the teachings of the present invention before them that anyone would reach for such an improper combination of references. The combination of Harnett and Madley et al is clearly improper as described above and Koppelman provides nothing to remedy the deficiencies of such a combination.

It is noted that in fact, it is not a simple matter or "obvious" to reduce the density of the Harnett material to the density of the cellular product described in the instant application. The only method known to accomplish such a density reduction

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is through the application of pressure as described in the instant application and never mentioned or suggested in Harnett, Madley et al or Koppelman. Coals having the free swell indices as described and claimed in the instant application if allowed to swell "freely", i. e. without the application of pressure to control swelling, will swell and then collapse upon themselves. Pressure is applied as described in the instant application to moderate volatile loss rate, allowing the coal to coke (become rigid) while it is losing mass in the form of volatiles and concurrently swelling. Additionally, the application of pressure serves to create a uniformly porous mass, i. e. one of relatively uniform cell size and density, which is necessary to obtain the properties described in the instant application.

It is therefore respectfully submitted that rejection of claims 5-10 under 35 U.S.C. 103(a) is improper and should be withdrawn.

Claims 11-15 stand rejected under 34 U.S.C. 103(a) as unpatentable over Harnett combined with Madley et al in view of Kuroda JP-0811287619A. Kuroda is added to Harnett and Madley et al as discussed hereinabove for the proposition that it discloses laminated sheets comprising a core of charcoal powder and activated carbon powder and that it would be obvious to the skilled artisan to laminate the product of Harnett in view of the teachings of Kuroda to form a laminate from a charcoal powder. For the reasons discussed above as to the inappropriateness of applying Harnett taken alone or in combination with Madley et al Applicant respectfully traverses this rejection. Since Harnett taken alone or in

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combination is Madley et al is not a proper reference against the earlier claims of the instant application, to now assert that this inappropriate rejection can be supported to reject additional claims on the basis of a reference that suggests the incorporation of a powder into a laminate as opposed to the cellular materials of the present invention is clearly improper and such rejection should clearly be withdrawn.

Claims 1-15 stand provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-12 of copending Application No. 09/453,729 in view of GB 1,489,690 to Madley et al. Applicant respectfully traverses this rejection since the teachings of Madley et al are clearly to "modify" a high volatile coal to provide an extremely low volatile material that would not function in Applicant's claimed process and therefore would not produce Applicant's claimed products. There is no suggestion in either Madley et al or the cited Application to use a "modified" coal-based material to obtain the inventions claimed in the instant application. Applicant does, however, express his willingness to file an appropriate Terminal Disclaimer in the event such a double patenting rejection is upheld.

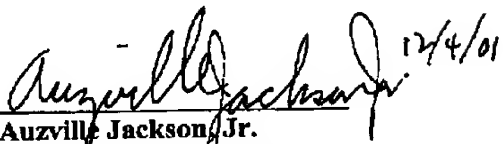
In view of the arguments presented hereinabove as to the clear distinctions between: 1) the materials and processes of Harnett alone or when combined with Madley et al; and 2) the processes, materials and products described and claimed in

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the instant application, it is respectfully submitted that all claims stand in condition for allowance and the same is respectfully requested at an early date.

Clean and marked-up copies of the amended page 6 of the specification are included herewith.

Respectfully submitted,

  
Auzville Jackson, Jr.  
Registration No. 17,306

8652 Rio Grande Road  
Richmond, VA 23229  
(804) 740-6828  
Fax: (804) 740-1881

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about 3.5 and about 5.0 and preferably between about 3.75 and about 4.5. Selection of starting materials within these parameters was determined by evaluating a large number of coals characterized as ranging from high to low volatiles. In general, it has been found that bituminous coals exhibiting free swell indexes within the

5 previously specified ranges provided the best foam products in the form of the lowest calcined foam densities and the highest calcined foam specific strengths (compressive strength/density). Coals having free swell indices below these preferred ranges may not agglomerate properly leaving a powder mass or sinter, but not swell or foam, while coals exhibiting free swell indices above these preferred

10 ranges may heave upon foaming and collapsed upon themselves leaving a dense compact.

The production method of the present invention comprises: 1) heating a coal particulate of preferably small i.e., less than about 1/4 inch particle size in a "mold"

15 and under a non-oxidizing atmosphere at a heat up rate of from about 1 to about 20°C to a temperature of between about 300 and about 700°C; 2) soaking at a temperature of between about 300 and 700°C for from about 10 minutes up to about 12 hours to form a preform or finished product; and 3) controllably cooling the preform or finished product to a temperature below about 100°C. The non-

20 oxidizing atmosphere may be provided by the introduction of inert or non-oxidizing gas into the "mold" at a pressure of from about 0 psi, i.e., free flowing gas, up to about 500 psi. The inert gas used may be any of the commonly used inert or non-oxidizing gases such as nitrogen, helium, argon, CO<sub>2</sub>, etc.

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about 3.5 and about 5.0 and preferably between about 3.75 and about 4.5. Selection of starting materials within these parameters was determined by evaluating a large number of coals characterized as ranging from high to low volatiles. In general, it has been found that bituminous coals exhibiting free swell indexes within the previously specified ranges provided the best foam products in the form of the lowest calcined foam densities and the highest calcined foam specific strengths (compressive strength/density). Coals having free swell indices below these preferred ranges may not agglomerate properly leaving a powder mass or sinter, but not swell or foam, while coals exhibiting free swell indices above these preferred ranges may heave upon foaming and collapsed upon themselves leaving a [dens] - - dense - - compact.

The production method of the present invention comprises: 1) heating a coal particulate of preferably small i.e., less than about  $\frac{1}{4}$  inch particle size in a "mold" and under a non-oxidizing atmosphere at a heat up rate of from about 1 to about 20°C to a temperature of between about 300 and about 700°C; 2) soaking at a temperature of between about 300 and 700°C for from about 10 minutes up to about 12 hours to form a preform or finished product; and 3) controllably cooling the preform or finished product to a temperature below about 100°C. The non-oxidizing atmosphere may be provided by the introduction of inert or non-oxidizing gas into the "mold" at a pressure of from about 0 psi, i.e., free flowing gas, up to about 500 psi. The inert gas used may be any of the commonly used inert or non-oxidizing gases such as nitrogen, helium, argon, CO<sub>2</sub>, etc.